REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. Rejection of Claims 1-6, 13-14, 16, 19-21, 27-31 and 33-35 under 35 U.S.C. § 103(a).

Claims 1-6, 13-14, 16, 19-21, 27-31 and 33-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Patel et al. (U.S. Patent No. 6,731,600) in view of Nandy et al. (Patent No. 6,826,147). Claims 1, 14 and 27 are the pending independent claims in this group of rejected claims.

After carefully considering the grounds for rejection, the Applicant responds as follows.

(a) Claims 1, 14 and 27. Independent Claims 1, 14 and 27 are directed to controlling network congestion.

In support of the rejection, the Examiner asserts that the Patel / Nandy combination teaches each and every element of Claims 1, 14 and 27. In response, the Applicant traverses the grounds for rejection because Patel and Nandy cannot properly be combined and, even if the references are combined, they fail to teach to otherwise render obvious the combination of elements in each of Claims 1, 14 and 27.

More particularly, as the Applicant will now explain, the Examiner improperly combined Patel and Nandy and, in addition, the "*vmss*" value in Nandy is not used in any manner for communicating information, such as packet state, from a sender to a receiver. Accordingly, the Nandy reference provides no additional support for the rejection, and the combination itself would require changing the objects and operating principles of the Patel reference.

Teachings of Patel Reference

Patel is directed to a "*System and Method for Determining Network Conditions*" (from its title) that sends a first and a second packet (e.g., time stamp) from a server to a client and reports latency (see also Patel's FIG. 3 and FIG. 4). In the Office Action,

the Examiner admits that Patel does not teach the use of an MSS for signaling the back-to-back state of packets, but then cites Nandy in combination with Patel to provide such further teaching.

Improper Combination of Nandy with Patel

The Patel / Nandy combination proposed by the Examiner is improper because such a combination would necessitate changing the objects and operating principles of the Patel reference, and, further, would render Patel unsuitable for its intended purpose.

Nandy is directed to enforcing "*Service Level Agreements (SLAs)*" (col. 1, lines 23-25), which are "*enforced at the edge of different domains by edge routers*" (col. 1, lines 30-31). Nandy explains that "*the present invention improves fairness in a differentiated services (DS) network by enforcing congestion control at the edges of the network*" (col. 2, lines 37-39), and operates in response to a "*credit system for each aggregate flow*" (col. 2, 37-45).

In stark contrast, Patel is directed to a "*system and method for determining network conditions*" (title in col. 1, lines 1-2), and more specifically teaches that in Patel's system and method a "*transmission latency detector uses transmission time and receipt time values to determine the changes in time it takes for a selected portion of the data object to be transmitted from the server computer to the client computer*" (See Patel's Abstract). In summarizing its object, Patel states in col. 1, lines 46-49, that: "*The system should be able to detect changes in latency in the transmission of packets, estimate the maximum transmission bandwidth for a network or both.*" Patel is clearly not directed to operation at a router edge for a DiffServ (DS) system, nor is it directed to enforcing SLAs. Consequently, the objects and operating principles are clearly different in these references, thereby rendering their combination improper. Therefore, the Examiner has not established a *prima facie* case of obviousness as required by MPEP §2143.01(VI), which provides in pertinent part:

MPEP 2143.01 VI.THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)."

Furthermore, the object of enforcing SLAs by limiting packet transmissions at an edge router, as per the Nandy reference, would clearly interfere with Patel's object of measuring network conditions and latency. For example, packets held up in buffers at the edge by the SLA policy would render traffic and latency measurements meaningless. Still further, Nandy controls SLA policy in response to a credit mechanism (using *vmss* constant). For example, Nandy explains that: "*Credit for the flow is incremented only when control packets can be inserted into the flow*" (col. 2, lines 49-50), which are "*injected into the flow for every fixed amount of data belonging to the flow*" (col. 2, lines 52-55). The injection of these control packets would further disrupt the latency and maximum bandwidth measurement objects of Patel.

Therefore, the combination of Nandy with Patel would necessitate changing the exact traffic flow which Patel needs to measure and would thus render Patel unsuitable for its intended purpose. As a result, the rejection is improper under MPEP §2143.01(V), which provides in pertinent part:

MPEP 2143.01 "V. THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

Furthermore, in addition intractable deficiencies in grounds for rejection set forth above, the Nandy reference does not teach what it is purported to teach and, therefore, a Patel / Nandy combination still does not teach the entirety of elements in each of Claims 1, 14 and 27.

In the Office Action, the Examiner states that "*Nandy did teach editing the maximum segment size to provide an indication (column 10, lines 38-41, where this shows congestion control window is adjusted and congestion control windows are adjusted by editing their associated MSS values; and column 7, lines 48-57, where this shows that the MSS indicates the amount of credits that can be sent. Thus, adjusting MSS values for indication purposes is shown).*"

However, the cited portions of Nandy do not teach changing the MSS value to provide an indication about any form of packet status from the sender to the receiver as recited in the Applicant's claims. The Applicant will now discuss the Examiner's misreading of Nandy in detail.

Nandy creates a constant (i.e., vmss) used for incrementing and decrementing credits at an edge (see column 2, lines 47-50), and for determining at that edge whether packets can be communicated past the edge or should be queued at the edge and sent later. Not only is the vmss constant different from MSS, Nandy does not discuss using it as a means for communicating status between sender and receiver. Nor could vmss be used in that manner because there is no means by which the value moves from a sender to a receiver. It is clear, therefore, that Nandy is not repurposing the field at all, but creates this new constant for determining credits and thus whether the local router will send the data on or queue it up.

Moreover, Nandy does not teach adjusting the MSS value, or even the *vmss* value. In fact, Nandy does not teach adjusting either value for the purpose of providing an explicit indication from sender to receiver. Nandy only discusses use of a simple constant "vmss" (col. 7, lines 47-50; and col. 10, lines 35-41) for incrementing and decrementing credits for enforcing the SLAs (col. 2, lines 47-50). There is nothing in the Nandy reference which provides any teaching, suggestion, motivation or incentive for utilizing the MSS value of a segment (or vmss constant) for the additional purpose of communicating an explicit indication -namely back-to-back packet status - from a sender to a receiver as recited in the Applicant's claims. Therefore, the rejection fails to

meet the requirements of MPEP §2142.03, which provides in pertinent part:

> 2143.03 All Claim Limitations Must Be Taught or Suggested
>
> To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Consider also the problem being solved by Nandy. Nandy notes that its focus is to "*address Quality of Service (QoS) issues in an Internet Protocol (IP) network*" (col. 2, lines 23-24), Nandy explains how this has previously been addressed using "*service level agreements (SLAs)*" (col. 1, line 24), which may include a "*committed information rate (CIR) and a peak information rate (PIR)*" (col. 1, lines 27-28). Nandy also explains that "*The SLAs are enforced at the edges of the different domains by edge routers…*" (col. 2, lines 30-31). Nandy then points out shortcomings of this conventional SLA enforcement, for example at col. 1, lines 56-57 where Nandy explains: "*However, many factors cause this scheme to become unfair with respect to factors such as bandwidth and delay*", and goes on to "*consider what happens between two aggregates, each with different numbers of microflows*" (col. 1, lines 58-59).

Toward overcoming these problems, Nandy discusses "*establishing a credit system for each aggregate flow through the edge. Only if credit is available from the flow will data from an edge node be forwarded to edge node's DS traffic conditioner*" (col. 2, lines 41-44). When credit is not available, "*the data will be queued at the edge node*" (col. 2, lines 45-46).

The foregoing discussion reinforces the fact that the Nandy reference is directed to entirely different objects and operating principles than Patel, and also that Nandy could not be combined with Patel without changing the objects and operating principles of Patel.

Additionally, the credit system of Nandy is used for aggregate flows to determine whether packets are to be forwarded or not. The credits do no provide a form of explicit communication between a sender and receiver regarding packet type as per the Applicant's claims, but ,instead, the credits merely provide a metric at this edge router for determining if packets are to be forwarded or queued. Credits are not taught for communicating status information about the packets to any other systems beyond the edge routers.

With regard to the use of MSS in the Nandy application, it will be seen that Nandy does not discuss the use of MSS, let alone altering the number of bits in relation to the MSS as per the Applicant's claims. One of ordinary skill in the art will readily recognize that the MSS value indicates the maximum segment size a TCP can receive, which is the conventional purpose of the MSS. In the Applicant's claims the MSS is being used for an additional, different purpose, to wherein "*the size of segments being sent is reduced a given number of bits from said maximum segment size (MSS) for explicitly indicating by the sender to the receiver that said packets are being sent back-to-back.*"

With regard to "vmss", Nandy refers to a "*notion*" of "*virtual maximum segment size*", and carefully explains how this represents the amount of aggregate flow data allowed for each credit, as seen in col. 6, lines 51-59, which are repeated below.

> "*Credit control unit 306 decrements credit for an aggregate flow by the amount of data belonging to that flow forwarded to the traffic conditioner 206. AFC block 204 uses the notion of a virtual maximum segment size (vmss) for the control flow. As explained earlier, the data belonging to the aggregate flow is considered the payload for the control flow. The virtual maximum segment size for the control flow is the amount of aggregate flow data allowed for each credit (e.g., 1514 bytes of data) before a control packet is inserted.*"

Refer now to one of the sections of Nandy that the Examiner cites in support of the rejection (col. 10, lines 38-41):

> *"If it is a control packet, credit for the aggregate is incremented by vmss bytes (block S624). Both control packets and data packets are then forwarded on to the network (block S626). If the control packet is dropped (determined in block S628), the congestion window for the control flow associated with the packet and aggregate is adjusted, in accordance with AIMD techniques for example (block S6301)."*

As has been shown above, Nandy does not teach adjusting the MSS value, or even the *vmss* value, and, more particularly, Nandy does not teach adjusting either value for the purpose of providing an explicit indication from sender to receiver as per the Applicant's claims. It is not possible for the simple constant "*vmss*" used by Nandy, which is used for incrementing and decrementing credits in the edge router, to communicate an explicit packet state indication from sender to receiver as per the Applicant's claims.

Note also col. 10, lines 38-41 of Nandy where Nandy refers to the use of "*AIMD techniques*", which is described in col. 9, lines 13-20 of Nandy as follows.

> *The AFC 204 at each edge router 104 thus allows increased data traffic by following TCP's Additive Increase and Multiplicative Decrease (AIMD) congestion control mechanism. As soon as a control packet is dropped, the virtual control TCP in the associated edge router 104 throttles the flow of customer data (following the AIMD mechanism) by limiting the availability of credit at the credit meter.*

From the above, we again see that when control packets are dropped at the edge router, the flow of data out of the edge router is throttled back – thus again it is seen that the operation is performed at the edge router and thus it is not modulating *vmss* for communicating information about the state of packets from a sender to receiver.

Refer now to the other section of Nandy That the Examiner cites in support of the rejection (col. 7, lines 48-57) which are duplicated below:

> *"Initially, the credit for each aggregate flow stored in credit bucket 310 is set to n+1 vmss, where n is the number of control flows maintained for the aggregate. Assume that vmss is 1514 bytes and that the user sends 1024-byte packets. If the credit was initialized to only one vmss, the first packet would drain 1024 bytes from the bucket. The second user packet could not be sent, since the remaining credit would be 490 bytes. No control packet would be generated either because vmss bytes of user data have not yet been sent. No credit update would cause a deadlock. Since the initial credit is instead set to n+1 vmss, the second user packet and a control packet will be transmitted, and vmss TCP credit will be added."*

One can see very clearly from the above, that Nandy uses vmss as a constant for multiplying the number of credits to arrive at a number of bytes which can be sent from the edge. This allows the edge device to determine whether to send out the packets or queue them in the edge router. Again, Nandy does not change the MSS value (or vmss), and certainly provides no indication of changing it for communicating additional information, such as regarding back-to-back packet type from sender to receiver as per the Applicant's claims.

Accordingly, Nandy does not teach the aspect of the invention for which it was relied upon by the Examiner. Adding the credit and *vmss* aspects of Nandy to the Patel reference does not enable Patent to communicate anything from sender to receiver, and, furthermore, provides nothing which relates to explicit marking of packets being sent back-to-back as recited in Applicant claims.

It will be noted that the Applicant has amended Claims 1, 14 and 27 to assure a proper understanding of how MSS is used for communicating back-to-back status from sender to receiver. In particular, rather than simply reciting that MSS "*is modulated*" the claims have been amended to recite that "*the segments being sent have a size that is reduced a given number of bits*" from a MSS. Such amendments should bring additional clarity to the claims, and are supported by the specification (e.g., paragraph [0029]).

Therefore, for at least the reasons explained above, the asserted combination of Patel and Nandy does not teach all the elements of each rejected claim, and Nandy is

not combinable with Patel. Accordingly, the Applicant respectfully requests that the rejection of Claims 1, 14 and 27 and the claims which depend therefrom, be withdrawn and that those claims be allowed.

(b) Claims 2-6, 13, 16, 19-21, 28-31 and 33-35. Claims 2-6, 13, 16, 19-21, 28-31 and 33-35 depend from independent Claims 1, 14 and 27 whose patentability has been discussed above. Therefore, those claims are patentable over the cited references for at least the reasons that their base claims are patentable. Accordingly, the Applicant respectfully requests that the rejection of Claims 2-6, 13, 16, 19-21, 28-31 and 33-35 be withdrawn and that those claims be allowed..

2. Rejection of Claims 7, 10-12, 15, 17, 22-24 and 36-39 under 35 U.S.C. § 103(a).

Claims 7, 10-12, 15, 17, 22-24 and 36-39 were rejected under 35 U.S.C. §103(a) as unpatentable over Patel et al. (U.S. Patent No. 6,731,600) in view of Zhang (U.S. Publ. No. 2005/0144303).

In response, the Applicant traverses the rejection as lacking any support whatsoever. This group of rejected dependent claims is based on rejected independent Claims 1, 14 and 27. Yet, the Examiner has admitted that Patel does not teach all of the elements of each of Claims 1, 14 and 27. The Examiner then relied on Nandy to teach what Patel lacked in that regard, and, as the Applicant explained above, Claims 1, 14 and 27 are patentable over the Patel / Nandy combination. How then could Zhang be cited in combination with Patel to reject dependent claims when Zhang has not, and cannot, be cited in combination with Patel to reject the base claims? Therefore, rejection is defective because dependent claims are patentable for the reasons that the base claims are patentable.

In view of the foregoing, the Applicant respectfully requests that the rejection of Claims 7, 10-12, 15, 17, 22-24 and 36-39 be withdrawn and that those claims be allowed.

3. Rejection of Claim 26 under 35 U.S.C. § 103(a).

Independent Claim 26 was rejected under 35 U.S.C. §103(a) as unpatentable

over Patel et al. (U.S. Patent No. 6,731,600) in view of Zhang (U.S. Publ. No. 2005/0144303), and further in view of Nandy et al. (U.S. Patent No. 6,826,147). Claim 26 is directed to a system for controlling network congestion.

In the Office Action, the Examiner admits that Patel does not "*explicitly state wherein said network operates according to a transport control protocol*". The Examiner then proposes a Patent / Zhang / Nandy combination to support a rejection of Claim 26.

In the same manner as with the rejection of Claims 1, 14 and 27 based on the Patel / Nandy combination, the Examiner states that "*Nandy did teach editing the maximum segment size to provide an indication (column 10, lines 38-41, where this shows congestion control window is adjusted and congestion control windows are adjusted by editing their associated MSS values; and column 7, lines 48-57, where this shows that the MSS indicates the amount of credits that can be sent. Thus, adjusting MSS values for indication purposes is shown).*"

However, as the Applicant has discussed in the previous section regarding the Patel / Nandy combination, Nandy does NOT teach reducing the number of bits below the MSS value to provide an indication about packet status from the sender to the receiver as per the Applicant's claims. Furthermore, it is improper to combine Nandy with Patel, as has been clearly explained in the Applicant's prior discussion.

Furthermore, Zhang provides no further teachings with regard to utilizing the MSS for explicitly marking packets as being sent back-to-back as recited in Claim 26.

Therefore, the Applicant respectfully requests that the rejection of Claim 26, and the claims that depend therefrom, be withdrawn and that those claims be allowed.

4. Rejection of Claim 25 under 35 U.S.C. § 103(a).

Claim 25 was rejected under 35 U.S.C. § 103(a) as unpatentable over Patel et al. (U.S. Patent No. 6,731,600) in view of Official Notice.

In response, the Applicant traverses the rejection as lacking any support whatsoever. Claim 26 depends from Claim 14, yet the Examiner has admitted that Patel does not teach all of the elements of Claim 14. The Examiner then relied on

Nandy to teach what Patel lacked in that regard, and, as the Applicant explained above, Claim 14 is patentable over the Patel / Nandy combination. How then could so-called "Official Notice" be cited in combination with Patel to reject a dependent claim when such "Official Notice" has not, and cannot, be cited in combination with Patel to reject Claim 14? Therefore, rejection is defective because dependent claims are patentable for the reasons that the base claims are patentable.

Therefore, Applicant respectfully requests that the rejection of Claim 25 be withdrawn and that Claim 25 be allowed.

5. Amendment of Claims 1, 14, and 26-27.

Claims 1, 14, and 26-27. Independent Claims 1, 14, and 26-27 were amended to recite the MSS change aspect of those claims with increased particularity. Instead of simply referring to it being "*modulated*", these claims now specifically recite that "*the segments being sent have a size that is reduced a given number of bits from a maximum segment size (MSS)*". Support for these amendments can be found throughout the specification, including paragraph [0029]. In addition, this portion of the claim language reiterates that the "*explicit indicating*" is "*by a the sender to the receiver*", wherein the claim is not reciting simply an internal tracking, such as Nandy tracking credits within the edge router. Support for this language can be found in the specification, including paragraph [0028].

6. Amendments Made Without Prejudice or Estoppel.

Notwithstanding the amendments made and accompanying traversing remarks provided above, Applicant has made these amendments in order to expedite allowance of the currently pending subject matter. However, Applicant does not acquiesce in the original ground for rejection with respect to the original form of these claims. These amendments have been made without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding these amendments. Applicant reserves the right to pursue the original scope of these claims in the future,

such as through continuation practice, for example.

7. Conclusion.

Based on the foregoing, Applicant respectfully requests that the various grounds for rejection in the Office Action be reconsidered and withdrawn with respect to the presently amended form of the claims, and that a Notice of Allowance be issued for the present application to pass to issuance.

In the event any further matters remain at issue with respect to the present application, Applicant respectfully requests that the Examiner please contact the undersigned below at the telephone number indicated in order to discuss such matter prior to the next action on the merits of this application.

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Respectfully submitted,

/Rodger H. Rast/

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